

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON RISK MANAGEMENT FRAMEWORK – RISK TABLES, AND OTHER APPROACHES

The Scientific and Statistical Committee (SSC) discussed two frameworks for considering scientific and management risk and uncertainty. Angela Forristall (Council staff) and Tim Copeland (Ecosystem Workgroup, Idaho Department of Fish and Game) provided an overview of salmon risk tables and Will Satterthwaite (Southwest Fisheries Science Center) discussed the scientific paper *Methods for assessing and responding to bias and uncertainty in the U.S. West Coast salmon abundance forecasts* ([Satterthwaite and Shelton 2023](#)).

The SSC strongly recommends reporting metrics of bias and uncertainty for all stocks with forecasts and postseason abundance estimates in the Review of Fisheries and Pre-season Reports by the Salmon Technical Team (STT). This would not require much additional work as most measures can be easily calculated in Excel or with available R code. Satterthwaite and Shelton (2023) present two options that could be easily included in these reports, C (a metric of bias) and σ (a metric of precision). Reporting standardized metrics across stocks could simplify conversations about bias and uncertainty in salmon forecasts, which have been intractable when varying metrics and time spans are used by different individuals and groups.

In contrast to how uncertainty is incorporated explicitly in some other FMPs, Council salmon management lacks a standardized approach to account for uncertainty in forecasting and environmental conditions. Introducing frameworks for explicit incorporation of uncertainty into the process could improve transparency, consistency, and repeatability and may reduce the possibility of accounting for the same uncertainty at more than one point in the process (e.g., if a forecast method takes environmental conditions into account and then managers took added precautions due to those same environmental conditions). Satterthwaite and Shelton (2023) demonstrate how frameworks that incorporate bias correction and/or a P* buffer may have led to fewer years of overfishing and low escapement for Sacramento River Fall Chinook (SRFC) management from 2014 to 2021, with fairly modest decreases in mean SRFC harvest. This framework may be able to provide greater stability in allowable catch.

Metrics of bias and uncertainty proposed by Satterthwaite and Shelton (2023) may also be included as columns in risk tables. Risk tables might inform the selection of P* if buffers were implemented for salmon forecasts. While salmon risk tables were not analyzed as extensively as the bias correction and P* framework of Satterthwaite and Shelton (2023), they have shown utility in the groundfish stock assessment process. With additional work, risk tables could be explored with a retrospective and/or simulation analysis for some salmon stocks.

Both proposed frameworks may minimize the extra workload of implementation and annual updates for Council-managed salmon stocks. As the Council rebuilds capacity on the STT, it may be helpful to consider additional members (in existing vacant seats or newly created seats) who have experience with compiling the information needed for risk tables or who could help conduct additional analyses needed to refine possible frameworks that deal with bias correction and/or uncertainty buffers.